



JUNE 1988

COLORADO SPRINGS,
COLORADO

PIKES PEAK RADIO AMATEUR ASSOCIATION, INC.

P.O. Box 16521
Colorado Springs, CO 80935

FIRST CLASS MAIL



Ø BEAT



P.P.R.A.A. DIRECTORS

PRESIDENT	Ron Deutsch NØØP 6050 Del Paz Dr. 80918	593-8352
V. PRESIDENT	Keith Goobie NYØT 5335 Coneflower Lane	637-1525
SECRETARY	Al Vrooman NØCMW 1341 Diana Ln. 80909	473-1660
TREASURER	Bud Libengood NØDDF 1596 Westmoreland Dr. 80907	599-7699
Board Member	Max Stafford KDØEL 6580 Snowbird Dr.	590-8949
Board Member	Bdale Garbee N3EUA Black Forest	495-0091
Board Member	Nick Hulbert KG5N 4745 Brown Valley Ln. 80907	593-8603
Board Member	Chris Smith NXØE P.O. Box 16397 80935	495-0624

ZERO BEAT is published monthly in the interest of the members of the Pikes Peak Radio Amateur Association, Inc., P.O. Box 16521, Colorado Springs, Colorado 80935. Cost is 50¢ per month for non-members or a \$4.00 per year subscription. Permission is given to reprint articles or excerpts provided credit is given. Deadline for submission of articles is the 21st of the month. Classifieds accepted anytime.

The Pikes Peak Radio Amateur Association meets on the second Wednesday of each month at Giuseppe's Depot Restaurant at 10 S. Sierra Madre at 7:30 p.m. All amateurs and interested parties are invited to attend.

Editor: Keith Goobie NYØT, 5335 Coneflower Ln., Colorado Springs, CO 80917 637-1525

EDITORIAL

It is time that I exercise my editorial privilege to bestow my thanks, and I am certain that of the Club membership to two men who have contributed significantly to the overall success of the club. They are Les KCØNC and Phil VEIARC.

First I would like to thank Les for volunteering to organize the Club Swapfest this year. When it seemed that the swapfest may not happen this year as there was no one who wanted to field the job, Les jumped in to show us all up. You have to realize that Les literally taking his life in his hands as his daughter was getting married the week before and juggling two major events in the span of two weeks can bring the best of us to our feet!

Les' cool, calm and collected manner (at least it seemed that way to us) was certainly evident the whole way through and I am sure that he was certainly appreciative of the way in which the Club membership pitched in to help in before and after the Swapfest.

To me, the Swapfest was an overwhelming success due to the efforts of one man! The measure of your success was evidenced by the large turnout from amateurs all along the Eastern Slopes.

I ask that the club membership express their thanks to Les the next time they see him at the Saturday morning breakfast or at a Club meeting.

Again Les. Thank You!

The second person who is worthy of our attention is Phil, VEIARC. He is being transferred back to Canada this summer after a three year assignment with Air Force Space Command Part and parcel of the whole package was that he was also promoted to Lieutenant Colonel!

Phil has done much to help the Ham Radio spirit in Colorado Springs. Shortly after his arrival here, he accepted the job of being the editor of this newsletter. Based on my conversations with many of the club members, it was only after his taking over of the newsletter that it became an item that everyone looked forward to receiving. It was in his second year as Editor that he won an award for producing a top-notch magazine.

Because of the manner and style that Phil managed the newsletter, it was seldom that he had to invent articles or go searching in other newsletters! As a result of the enthusiasm that he generated in the club membership towards the newsletter, he could always remain proud of the fact that it was mostly comprised of home grown articles (which is also a tribute to the amateurs in the Colorado Springs area as well).

Phil was also one who promoted the breakfasts that were held every Saturday mornings as well as he was the principle behind the Wednesday morning Military Amateur Breakfast. He could always be depended upon to volunteer for the Public Service Events as well and he, to the best of my knowledge attended/participated in all the Hill Climbs while he was here.

I ask that the membership extend their thanks to Phil as well and wish him Bon Voyage on his new endeavours.

THE DOLLAR VERSUS THE YEN & THE EFFECT UPON AMATEUR RADIO

Been watching the advertised prices for ham gear as of late? Notice the creeping increases in much of the Japanese equipment?

It's an example of "cause and effect" - the dollar falls in value, the yen increases.

Most transceivers we buy are made in Japan. With the steep fall of the US dollar, and with Japanese manufacturers no longer willing to cut profits by holding down prices, the inevitable: prices are moving upward.

To illustrate using advertised discount prices, in early 1987 an Icom 735 HF rig was selling at \$795; now it is about \$900. A Kenwood TS440S one year ago was \$885; now it's \$950 or more. On the other hand, when one recalls some of the early Japanese two meter rigs of 10 or 15 years ago that cost about as much as current models, we are certainly getting more bang for the buck.

Today Japanese "cheap labour" is not so cheap; workers are losing their jobs to "cheaper labour" in Taiwan. At least one Japanese auto plant in the US now exports cars to Japan, a reversal of the historic position. In brief, US labour is now "cheaper" in many respects than Japanese labour how the times have changed.

Want to guess if US manufacturers will once again turn out ham rigs? Only time and the dollar will tell - meanwhile, chances are slim that current prices will do anything but rise, so... Is this the time to buy that newest state-of-the-art rig?

On a different note, the new 1988 - 1989 ARRL Repeater Directory was made available at the end of April. Price should be \$5.00. There will be about 13,000 listings: repeaters, tone frequencies, digipeaters, plus band plans, frequency coordinators, etc. 220 Mhz, the biggest growing band, grew by over 275 repeaters.

73, George Hinds, N8CIX

ANOTHER VIEW FROM THE PEAK

by Norm Leslie N6CGP

The Ham who usually takes this space was probably too modest to submit this article as he was personally involved, but I believe it deserves mention to illustrate again what Hams get involved in. They do these things without looking for medals but they do appreciate a pat on the back occasionally.

You may know by now that we have had a search going for three days for a person missing in a rugged area North of Woodlawn Park. The search is primarily conducted by the Teller County Search and Rescue in conjunction with the Teller Sheriff's Office. Finally Fort Carson choppers were called in to provide air search. Channel 4 also offered assistance with their chopper, but were put on stand-by because of weather conditions.

The point of this article is to point out the cooperation of our Mountain Amateur Radio Club members. Two in particular deserve special mention.

Bob Bergman, WBOFLU and George Hinds, N8CIX. WBOFLU spent all three days and N8CIX spent numerous hours relieving him at times.

These Hams manned the S & R, Sheriff, Police, State, and our local repeater, maintaining communications between the searchers and authorities. Several other members of the Club monitored these frequencies through their scanners at home stations to relay messages by phone and 2 meters. Let's give these men a pat on the back.

As an aside neither Channel 11 or 13 TV appeared to be aware of the search that had been going on for three days, but was quick to report a suspected homicide which took place 30 minutes before. Are we up here in the hills a part of Southern Colorado or not?

REQUEST FOR INFO

I would like to include in the *N-Beat* a listing of the local nets on VHF/UHF and HF. Not being a net follower myself, I would appreciate if someone could compile a listing for me. It will see publication in the *N-Beat* on a bi-monthly basis or more often should readers desire. I am also looking for a listing of the VE Tests in the state of Colorado as well.

NYQT

VE TEST RESULTS

Congratulations to those who recently upgraded during the VE test session of 07 May, 1988.

Name	Call	Before	After
Don Chatelain	WB0BSZ	General	Advanced
Randall Rico	None	Pending	Technician
Jeffrey Boyer	KA0ZOY	Novice	Technician
Brian Nipper	No Lic		Technician
Keith Moran	?	Novice	Technician
Greg Pearman	No Lic		Technician
Charles Phelps	No Lic		Novice
Francis Byrnes	No Lic		Novice
David Jones	No Lic		Novice
Clifford Kohler	No Lic		Novice

The following is a composite of the VE Testing:

Elements	1A	1C	2	3A	4A	4B	Total
Given	6	1	6	5	1	1	20
Passed	6	0	6	5	1	1	19
Percent	100	00	100	100	100	100	95

Total applying 11--Total upgrades 10-- Percent upgrades 91 Upgrades by class 1 Advanced, 5 Technicians, and 4 Novices. My thanks to all the VE's who participated in giving the above tests. 73 NOLA

UNIDEN 10 Meter Transceiver

Bob Witte, KB0CY

The much-rumored all-mode 10 meter transceiver from Uniden Corporation was displayed at the Dayton Hamvention. Dubbed the President HR 2510, it covers 28.0 to 29.6999 MHz with 25 Watts out on USB, LSB and CW, 10 Watts on AM and FM. Uniden has been best known as a manufacturer of CB transceivers and Bearcat scanners. With Novices having phone privileges on 10 Meters, Uniden undoubtedly saw an opportunity to transfer some of its 11 Meter technology to 10 Meters.

The transceiver is not a stripped down model as it is fully synthesized, has a built-in S/R/F/MOD/SWR meter and scanning mode. Other features include CW sidetone, RF gain control, Receiver Incremental Tuning, Public Address capability and selectable Noise Blanking. A large LCD display is used to implement the frequency read-out and meter.

The rig sure looked interesting to me, with 10 meter activity increasing due to improved propagation and Novice phone privileges. With this radio, one can work CW and SSB as well as the FM portion of the band (29.5 to 29.7 MHz). The list price is somewhere around \$350, but I saw them for sale at Dayton for \$279.

POSITIVE CLOUD-TO-GROUND LIGHTNING Dr. W. David Rust, N5KCW

In the first article in this series, I presented a summary of cloud-to-ground (CG) lightning that lowers negative charge from the cloud to the ground. Negative CG flashes are by far the most common, about 95% of the ground strikes in typical thunderstorms. The remaining 5% are CG flashes that lower positive charge. In winter storms, severe storms, and the stratiform rain region (widespread moderate to heavy rain) behind the leading edge of squall lines, however, positive CG (+CG) flashes can be a much higher percentage.

The classic measurements of +CG strike characteristics were first made on towers atop Mt. San Salvatore in Switzerland. There it was documented that +CG flashes have higher peak currents, more charge transfer, and longer duration than negative strikes; all these make positive strikes more damaging, on the average than negative ones. Two other physical characteristics of +CG flashes are that they almost always have only a single return stroke. This is usually followed by continuing current, which is a continuous flow of several hundred amperes that can last a few tenths of a second. Continuing current, whether from positive or negative strikes, is responsible for most lightning-started fires in forests and presumably also in grasslands. You can guess continuing current is occurring if the ground strike, or part of it, does not flicker but seems to last a long time.

But why do we care about +CG flashes as opposed to negative ones? One reason is that they tend to be more damaging and strike tall towers, often resulting in damage to facilities on the tower. Is the height of a tower relative to its likelihood of having +CG strikes? The answer is undoubtedly yes, but there is no magic number. What is known is that very tall towers and those on mountain tops are the most likely to be hit by +CG strikes. In fact they trigger the flashes themselves, i.e., the lightning leader starts at the tower and moves up toward the cloud. Shorter towers and installations typical of amateur radio will generally not trigger flashes, but of course can be struck by naturally occurring ones.

It has only been in the last few years that we have found that +CG flashes occur naturally in severe storms, i.e., they usually come from the cloud and are not triggered. The occurrence of +CG flashes in the large and often severe storms in Oklahoma has been verified in the observational program at the National Severe Storms Laboratory. The present understanding, based on limited data, is that flashes from the heavy precipitation always lower negative charge, while

CONTINUED ON PAGE 8

VHF & ABOVE NEWS

by NK0P

The Spring VHF Sprints have come and gone for another year. The 2 meter sprint was very active. I heard 10 grids and 5 states on. The 220 sprint found KX0O and N6CMW out grid hopping near Lajunta, Colorado. They reported working Kansas, Nebraska, Wyoming, and Colorado using a KLM long boomer and Laurens new Yeasu 736. (With a little help from an AM6154 and a big generator!) I was out of town for the 432 sprint so I don't have a report on that one.

The PFRAA Swapfest at Rustic Hills Mall was a success. I saw several 10GHZ motion detectors for out the door as well as some cavities for some microwave band. The Front Range Microwave Society met for lunch at the Village Inn and exchanged stories and future plans.

The highlight of the day for patrons of the highest bands was the Avantec representative from Denver handing out free samples of their latest MMICS plus free application notes and catalogs. I shared a table with him and he was handing out goodies as fast as possible. I certainly hope everyone got a few and has some plans to try a circuit or two with these neat little devices. Thanks to K05N for arranging this little diversion!

I would like to welcome a new VHFer to the area, Doug, W2CRS. He moved here from New York and is living near Woodland Park now. (Good choice Doug!) Doug is active on 50, 144 and 432 SSB and CW right now so give him a shout if you here him.

The June VHF contest is rapidly approaching so tune up your gear and prepare! This year 50MHZ will be the band to watch. If it opens there could be some activity the like of which we have not seen since the late 1970s. I've heard of several grid expeditions so be on the look out for southeast and north east Colorado as well as our neighboring states.

Well it sure was great eyeballing so many VHFers at the Swapfest this year. Maybe next year we could have a forum on a VHF topic. Is anyone interested??? Give me a call and lets plan.

That's VHF and above for this month. 73s
Ron NK0P



Colorado Springs Wintronic Company

2838 N. PROSPECT, COLORADO SPRINGS, CO 80907
PHONE — (303) 636-1661

**WHOLESALE DISTRIBUTORS OF ELECTRONIC
PARTS, SUPPLIES AND EQUIPMENT**

BUYERNUT
HUSTLER
CUSHCRAFT
LARSEN
ANTENNA SPEC.
UNIDEN

WELLEN
FLUKE
BELDEN
AMPHENOL
MFI
S & W

ARRL BOOKS
SAMS BOOKS
TRIPP LITE (power supplies)
VAN GORDEN
BENCHER

AMATEUR RADIO LICENSE EXAMINATIONS

WHEN: Sat, 20 Aug 88 at 9:00 AM
WHERE: First United Methodist Church
420 North Nevada Avenue
Colorado Springs, CO
WALKINS: Allowed
TALK-IN: 146.37/97

NEEDED

1. Original FCC license, if any
2. A copy of your FCC license, if any
3. Two forms of positive identification (driver's license, birth certificate, passport or library card)
4. \$4.55 check or M.O. payable to ARRL/VEC
5. Completed FCC form 610
6. If physically handicapped, a physicians certificate describing the nature of the disability. Arrangements should be made prior to testing

Sponsored by: PIKES PEAK RADIO
AMATEUR ASSOCIATION

For more information contact:
Max Stafford 590-9849

ANTENNAS

By Chris Smith - NX8E

The last month has seen some accomplishments in local antenna work. Frank, NØEM, finished a 3 element Yagi for 10 meters. Many thanks to the group of hams who helped him put it up. It is up 30 feet on a home made mast, and it was quite an effort to get it up, as I've heard! The work was worth it for Frank, since it's made a noticeable improvement in signals heard on the band. Dimensions were noted for anyone wishing to duplicate the design.

Frank, Pete (NØLA) and I added a second run of coax to the ham shack at the Deaf and Blind school. This permitted the 2 meter antenna to move up to the attic a real improvement over the previous subterranean location. An 80 meter resonator was added to their "indoor vertical," to allow them to get on 5 HF bands. Some tuning is still needed. The club generously donated the funds to buy the school a 5 band trap dipole. This will replace the vertical and improve their signal. It also frees up the vertical for temporary use during the summer.

KØYPE, Jack, will also be putting out directional signals thanks to a PPRAA effort to put a beam up at his QTH. The beam, a Butternut HF5B, was put on the roof of a second story extension. The beam is up about 27 feet, supported by a 5 foot tripod and mast. Four way guying with wire (broken by insulators every 6 feet) should keep it in place despite wind and winter. I'll be curious to see how well it performs this winter. It is of a complex design and tunes very critically on the 5 bands from 20 to 10 meters. I wonder if the forces of nature will detune it significantly. No doubt Jack will keep an eye on it and let us know how it fares.

Incidentally, MININEC3 is now available without restriction to all who want it. The authors at NOSC don't distribute it, but I have an up to date version and documentation for local distribution. An improved version (informally called MININEC4) with some worthwhile improvements is being sold by Artech House. Contact them for a descriptive brochure and ordering information.

I hope the spring is going well for all of you. If you've done any antenna work during the recent pleasant weather, why not write it up and share with the readers of *Beaf*?

72 — Chris

Insurance

An amateur radio operator was sitting at his desk answering a letter from his insurance company.

I am writing in response to your new request for additional information for block number three of the accident form I put "Poor planning" As the cause of my accident! You said in your letter that I should explain more fully and I trust that the following details will be sufficient.

I am an amateur operator and on the day of the accident I was working alone on the top section of my new 80 ft tower. When I had completed my work I then discovered that I had over the course of several trips up the tower brought up about 300 pounds of tools and spare hardware. Rather than carry the now un-needed tools and material down by hand I decided to lower the items down in a small barrel by using a pulley which fortunately was attached to the gin pole at the top of the tower.

Securing the rope at ground level I went to the top of the tower and then proceeded to load the tools & material into the barrel. Then I went back to the ground and untied the rope holding it tightly to insure a slow descent of the 300 pounds of tools.

You will note in block number eleven of the accident reporting form that I weight only 165 lbs.

Due to my surprise at being jerked off the ground so suddenly I lost my presence of mind and forgot to let go of the rope.

Needless to say I proceeded at a rather rapid rate of speed up the side of the tower. In the vicinity of the 40 foot level I met the barrel coming down. This will explain my fractured skull and broken collarbone.

Slowed down slightly I continued my rapid ascent not stopping until the fingers of my right hand were two knuckles deep into the pulley. Fortunately by this time I had regained my presence of mind and was able to hold onto the rope in spite of my pain. At approximately the same time however the barrel of tools hit the ground and the bottom fell out of the barrel. Devoid of the weight of the tools the barrel now weighed approximately 20 lbs. I refer again to my weight in block number eleven. As you might imagine I began a rapid descent down the side of the tower. In the vicinity of the 40 ft level I met the barrel coming up. This accounts for the two fractured ankles and the lacerations of my legs and the lower body. The encounter with

CONTINUED PAGE 7

the barrel slowed me enough to lessen my injuries when I fell onto the pile of tools and fortunately only three of my Vertebrae were cracked. I am sorry to report however that as I lay there on the tools in pain unable to stand and watching the empty barrel 80 ft above me.... I again lost my presence of mind. I let go of the rope causing the remainder of the injuries.

Please wish me a speedy recovery and settle my claim.

Thank you
WB5JZP

DIT & BITS

FOR SALE

For the serious minded. Complete amateur radio station. 40 years of equipment and parts for building, service and repair. Everything from A Z to 20K - 25K value package deal only 15K. HF rigs, HB amps, VHF and test equipment. Everything to build or whatever must be seen to be appreciated. You name it, it is there. No Junk. Contact Leo, W4BXM 596-1650.

FOR SALE

1 - Kenpro KR-500 Elevation Rotor. Get ready for Phase IIIC -- \$90.
2 - OA-1378A/GRC -- Nam ara antenna, portable 20 foot tower with near 3 Ghz dish and feed horn -- \$75. Great for field day.
Contact John WD8FHG at 597-5407

FOR SALE

1 - Johnson 6 & 2 Thunderbolt 1 KW on 6 and 2 meters (neighbor maker) -- \$600.00
2 - Drop-in charger and speaker mike for San-tec HT \$25/20 respectively
Contact Ron NK8P at 593-8352

WANTED

12 volt regulated power supply - 20 Amps or better. Contact Ron NK8P at 593-8352

NEW RAFFLE

Starting this Saturday, Keith NYOT will selling tickets for the 220 MHZ HT that will be the prize that will be given away at the Club Picnic in August. He will make every attempt to be at the morning breakfasts at the Village Inn on Saturdays and he will also be selling tickets at the Club meetings between now and then

CLUB PICNIC

The Club Picnic is fast approaching. This year it will be held at the Air Force Academy courtesy of the AFA Radio Club. Jim WA9ABB has volunteered to organize it on behalf of the club. Please see him if you would like to help in any way.

UPCOMING SWAPFESTS

June 11/12 Loveland Swapfest (NCARC)
Loveland, CO, Larimer County Fairgrounds

July 17 Denver Radio Club SWAPFEST
Jefferson County Fairgrounds, Golden

July 23/24 Mountain Amateur Radio Club
SWAPMEET and Campout, Woodland Park, CO

Sept 25 BARCFEST88
Boulder County Fairgrounds

If I have left any out, please give a call at 637-1525 or leave me a message on my phone BBS at 637-1375 or leave me a message on Pack-et at PBBS WB0BLV

Rocky Mountain Area's

largest distributor of

HAM GEAR

ORAKE
YAESU
KIMPRO
HY-GAIN
BENCHER

MIRAGE
LARSEN
CUSHCRAFT
ANTENNA SPECIALISTS
HUSTLER

DAIWA
VIBROPLEX
PALOMAR
ROHN
WIL, NYE
B & W



GEORGE
KD8RW

RUTH
WB0PY

Electronic Sales Co.

800 Lincoln Street 832-1111

In Colo. - 1-800-525-6342



CW Electronic Sales Co.

"Serving Colorado's electronics needs for over 20 years."

RADIO • TV • LANDMOBILE • HAM • CB • VIDEO • AUDIO •
COMPUTERS • SATELLITE • SOLAR • TEST EQUIPMENT •
TOOLS • TELEPHONES • PA • SECURITY • SHORTWAVE •
CAR STEREO • INTERCOMS • RADAR DETECTORS •
CATV • MATV • SCANNERS • CALCULATORS •
ELECTRONIC PARTS AND MUCH, MUCH MORE!



610 E. FILLMORE 473-2828

OPEN WEEKDAYS 8:30 - 5:30 - SATURDAYS 9:00 - 1:00



CONTINUED FROM PAGE 4

those from the upshear (against the wind) and downshear (with the wind) anvil near the main storm tower can lower either polarity of charge. It appears that flashes in the anvil well downwind from the tower are positive. A few +CG flashes have been visually observed to emerge from beneath the wall cloud (the visible manifestation of the mesocyclone and the feature for which storm spotters continually search) in addition, data from auto-matic ground strike mapping networks such as the one displayed in the National Weather Service Office in Norman suggest that this may happen in many mesocyclones. We are testing the hypothesis that there are a few +CG flashes that occur in the mesocyclone as it initially increases in intensity. If verified, it is conceivable that the ground strike data could give additional information on which to assess storm severity.

It would also be interesting to examine whether maps of ground strike position and polarity (similar to the maps with radar reflectivity) could be transmitted via packet radio to storm spotters and whether the information is helpful in spotting.

CLOUD-TO-GROUND LIGHTNING (Part 2)

Dr. W. David Rust, NSK CW

I find that hams are often inquisitive of the nature of the lightning phenomenon against which they protect their radio gear. The purpose of this series of short articles is to provide fundamental information on lightning. If you have specific questions, we'll try to answer them in a later article. I use English units here, but you will find metric used in scientific publications.

Cloud-to-ground (CG) flashes usually start in the cloud when the potential difference at a point exceeds the breakdown voltage of air, about 1-3 million volts per yard. And no, this does not start because the charge in the cloud 'sees' the opposite polarity at the ground. Lightning initiation is apparently a very localized process (with the critically high field inferred to be only a few hundred yards across). Lightning may start at the tips of raindrops or other precipitation particles.

The breakdown of the air begins as corona (St Elmo's Fire), then lengthens to become a streamer. If the streamer continues a few tens of yards, it can become self-sustaining, i.e., it no longer needs as high an electric field to propagate. It continues with significant horizontal extent (usually several miles). After a few tens of milliseconds, this preliminary breakdown becomes downward moving, highly branched, and stepped. This process is the stepped-leader. The steps have lengths of about 30-100 yards and occur at intervals of about 100 microseconds. This process usually lowers negative charge from the cloud and is too dim to be seen by eye.

It is only when the lightning gets to within a few step lengths of an object that it 'knows' where it might strike. Actually what happens is that the field at an object, let's say a tree, gets so high that breakdown starts from it as an upward moving discharge (several nearby points can do this). This begins the attachment process. When the two discharges meet just above the tree, the connection between cloud and ground is complete and a very high current flows. This return stroke current is an upward propagating wave that moves up the channel initially at nearly the speed of light, but slows to about one-third the speed of light. Peak currents reach typical values of 40,000 amps, with 250,000 amps possible. Temperatures reach 30,000 degrees, and the power dissipation about 100 megawatts per yard of channel. This causes rapid expansion of the air and a shock wave that soon becomes a sound wave we know as thunder. Once back up in the cloud, the flash can continue or stop. If it continues, another leader can occur. This time it does not have to make a new channel through the air, but moves down the existing channel. There are no steps in this dart leader. Again there is a return stroke. If there are several strokes, you see it as a flickering of the channel. Three other points: (1) the direction of propagation is the same as the direction of branching; (2) the entire event is called a flash or a lightning strike (not stroke), and; (3) the net charge

CONTINUED ON PAGE 9

COLORADO COMM CENTER

Cushcraft

KANTRONICS

WE



KENWOOD

hy-gain

concept

QUATRON



LOWEST PRICES!

FACTORY AUTHORIZED SERVICE!



WE TRADE!

ASTRON YAESU



QUATRON

ICOM

NO CITY SALES TAX!

WAREHOUSE PRICES!

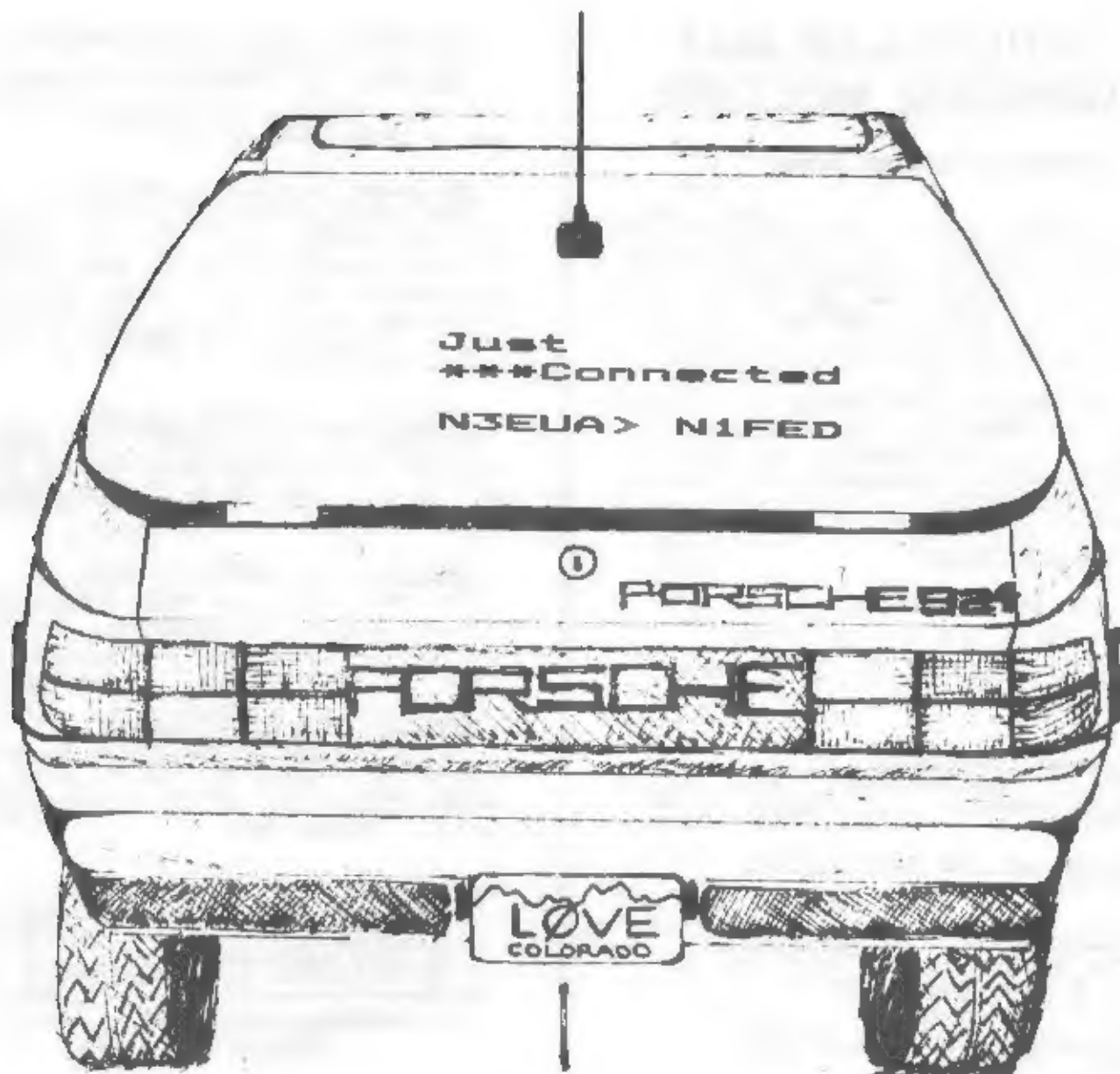
WE SHIP DAILY NATIONWIDE.

SATURDAYS TIL 3

288-7373

525 E. 70th Suite 1W
DENVER, CO 80229

NEXT TO VALLEY HIGHWAY
1 MILE NORTH OF MERCHANDISE MART



```

*****
*****
*****
***                                     ***
**      GATEWAY ELECTRONICS          **
*                                           *
*      "Gateway's Got It"           *
*                                           *
*      5115 N. Federal Blvd, # 32    *
*                                           *
*      Denver, CO 80221              *
*                                           *
*      This coupon worth $2.00 off next *
*      $15.00 purchase.              *
*                                           *
** Call 458-5444 for info/directions **
***                                     ***
*****
*****
*****

```

CONGRATULATIONS!

To BDale N3EUX and Karen N1FED who will be getting married shortly. We wish them all the best. The big question is will BDale have time to finish up his work on the 56 KBPS modems for packet radio?

FROM PAGE 8

moved from cloud to ground by this process is negative, i.e., a negative CG flash.

EDITOR'S NOTE : The third article in this series will be in next month's edition of O-Beat. These same articles have been on PBBS WB0BLV if you cannot wait.....Hi Keith

MINUTES OF MAY GENERAL MEETING

submitted by Al N0CMW, secretary

The general meeting of the Pikes Peak Radio Amateur Association was held at Giuseppe's Old Depot Restaurant, Wednesday evening 11 May 1988. The meeting was called to order by the president Ron NK8P at 19:30, and an introduction was made by all members and guests present.

The minutes of the previous General Meeting and Board meeting were approved as printed in Q-Beat (with two corrections, one that LUCI STANSBERRY is the breakfast person for Field Day and KAREN HONER'S (Publicity) phone number is 495-0091).

Committee Reports

Note: Anyone wishing to help out on any of these committees, please contact the chairman at the phone number listed. Thank you for your support.

Treasurer - Bud N0DDF (599-7699)

Previous balance was \$1404.41, income of \$276.25, expenses of \$179.81, leaving a balance \$1500.85.

Interference - Ron NK8P (593-8352)

Nothing to report.

Education - Harley KC8TO (634-4555)

The final exam for the Novice class will take place on Friday May 13, 1988.

Publicity - Karen N1PED (495-0091)

Nil.

Colorado Council of Amateur Radio

Clubs (CCARC) - Oak K0ROL (591-1426)

Just a reminder that the PPRAA will be hosting the CCARC in September.

Deaf and Blind School - Jim WA9ABB

(598-7543)

Nothing new to report.

Q-Beat - Keith NY8T (637-1525)

Keith will be setting up a Phone Bulletin Board System so that people wanting to submit articles to the Q-Beat may still be able to do so. The number is 637 1375.

ARES - Mallory N0IKE (591-0049)

ARES meets every Wednesday night except for Club meeting nights on the 3797 repeater at 1900 local. Mallory will be taking over from Al N0CMW as the District 14 ARES. Contact him for an ARES application.

Public Service - Mike K0TER (636-1290)

Mike listed the events that he will need help to organize and run. They are Volks March in the Black Forest, Walk for America on May 15, and the Rocket Launch in August.

VE Testing - Max K0DEL (590-9849)

Irene AH6GF tendered her resignation as the VE Liaison effective the 11 May 88. K0DEL, Max has volunteered to take her place. It was also mentioned that anyone wanting to give a Novice exam could see Jim WA9ABB (598-7543) who has a program for the IBM PC that can generate Novice Exams.

SWAFFEST - Les KC0NC (634-3995)

Everything is running smoothly. Elinor reports that more help is needed in selling the raffle tickets. Set-up of tables will be on Friday evening May 20th at 5pm.

Teller Hill - Doc W0MCT (596-8216)

This year it will be held on Sat and Sun, the 11th and 12th of June respectively. On Sept 24th and 25th, the Divide / Cripple Creek race will need volunteers as well.

Field Day - Max K0DEL (590-9849)

Dates are the 25th and 26th June at Air Force Academy Picnic Ground #3. Can not set up till Saturday morning, but we will be permitted to operate all Saturday Night.

Centennial ★ ★ RES ELECTRONICS

2324 East Hwy, Colorado Springs, CO 80905
PHONE: (303) 633-4664

COLUMBIA
ELECTRONIC CABLES

Weller® Xcelite®

SPRAGUE

GC
ELECTRONICS

SIMPSON METERS

Chemtronics Inc.,



SOAR

VIZ

Mfg. Co.

TEST INSTRUMENTS

TECH
SPRAY

ARRL

Largest Supply of Electronic Parts
In Southern Colorado

Howard W. Sams



TAB BOOKS

Old Business

Nominations for the vacant board position were Doug NØHJT and Max KDØEL. After a secret vote, Max emerged victorious.

The By laws change that non-office holding board members be responsible for programs was voted on and passed.

New Business

Nil.

Prizes - Keith NYØT

Winners were:

NØDDF Bud	Mystery Box
WB7THT Rick	QSL cards
KA9BWH	Advanced Book/Tapes
KØROL Oak	Swivel Mount
KAØYVZ	Headset
NØFRQ	Computer Book
WBØMNA	Bahun
VE1ARC Phil	Keyer
WDØBSZ Don	Raffle Tickets
WØMCT Doc	Black Box

Program:

The original program had to be canceled as the guest speaker was no longer working for the company that he was going to represent, namely ETO. In lieu, we like to thank Malcolm for talking on the Severe Weather Group that he is a member of and presenting a couple of video tapes on tornadoes and floods that his group help warn against.

The meeting was adjourned at 2130.

The next meeting will be 08 June 88.

MINUTES OF MAY BOARD MEETING

submitted by AI NØCMW

The board meeting was held on Monday 16 May 88 at the home of AI NØCMW. Meeting was opened by President Ron NKØP at 1900 hrs. Present were Bud NØDDF, AI NØCMW, Chris NXØE, Nick KG5N, Les KCØNC, Jody KAØROZ, Susan KA7NNX, BDale N3EUX, Karen N1FED, Ron NKØP, and Field Day Barney KAØBALL.

A discussion was held on the programs that would be given at the up coming monthly club meetings. To date, the June meeting will have Max KDØEL talk about Field Day preparations and in July we will have a talk on high power microwave weapons. In August it was hoped that NABØA (the man that toured the US on bicycle) would come address the club. He requested that the club provide him a room for the evening. This was turned down as it is the club policy that we will provide our guest speakers with the evening meal only. Several other programs will be looked into by Karen and Malcolm.

The club authorized the Swapfest group to expend \$150.00 for the hourly prizes.

The swapfest was discussed and all is going fine. Tables are being sold at the normal rate and and raffle ticket sales are still slow.

The next Board meeting will be held at the QTH of Ron, NKØP.

The meeting adjourned at 2050 hrs.

JUNE MEETING

The next regularly scheduled meeting of the Pikes Peak Radio Amateur Association will be held on Wednesday, 08 June 88, at 7:30 PM at Giuseppe's Depot at #10 Sierra Street. Max KDØEL will talk about Field Day preparations and the stations that will be on the air this year. He will provide directions on how to get there.

AIR FORCE ACADEMY AMATEUR RADIO CLUB

On May 11, 1988, the AFA Radio Club held its monthly meeting at Arnold Hall. In addition to serving military members, the club is open to all civilian employees of the academy as well retired military.

Dues of \$5.00 a year was established and Treasurer Jim WA9ABB collected from each member. A discussion was held on projects for the club.

This year the Club will be hosting the PPRAA for the June Field Day and the August Picnic.

Next meeting will be June 8 at 1130 at Arnold Hall.

MILEY'S RADIO

Jess KØTAA 719 W. 7th St. Florence, Colorado 81226 (303) 784-3040
Hours 9 to 6 Tuesday through Friday — Saturdays 9 to 1 — Evening Hours 7:30 to 10 (Call Ahead)
Closed Saturday 1 PM, Sunday & Monday
New Area Code Effective 3/1/88 (719) 784-3040
Will be closed, except by telephone appointment,
from June 9 through July 25, 1988.

Will get your phone messages by remote and call you
that evening or next morning. Please leave both
day and evening phone numbers on our machine.

If you're looking for a certain rig — put a message
on our machine and we'll try to find it for you.

In stock all the new equipment plus lots of
used equipment — please call.

Hamfest Schedule for 1988 as of February 1:

June 10—June 11 Superfest, Loveland, CO
Friday Noon—9 P.M., All day Saturday, No Sunday Swapfest
June 18 Levelland, TX
July 2—July 4 Rapid City, SD
July 9—July 10 Laramie, WY
July 16—July 17 East Glacier, MT
July 22—July 24 Woodland Park, CO
August 13—August 14 W.I.M.U. at Macks Inn, ID
August 13—August 14 Amarillo, TX
We will be at Amarillo.

73's — Jess

5/88

Membership Application PIKES PEAK RADIO AMATEUR ASSOCIATION, INC.

P.O. Box 16521
Colorado Springs, CO 80935

Name _____

Address _____

City _____ State _____ Zip _____

Call _____ License Class _____

Are You An ARRL Member? ☐ Yes ☐ No Telephone _____

☐ Full Member \$12.00 ☐ Family Membership \$15.00 ☐ Newsletter Only \$4.00

☐ Age 65 or older, or under 18 \$8.00

Additional Names _____ Call _____ Class _____

Associate Member \$8.00 ☐ (Outside Teller & El Paso Counties.)